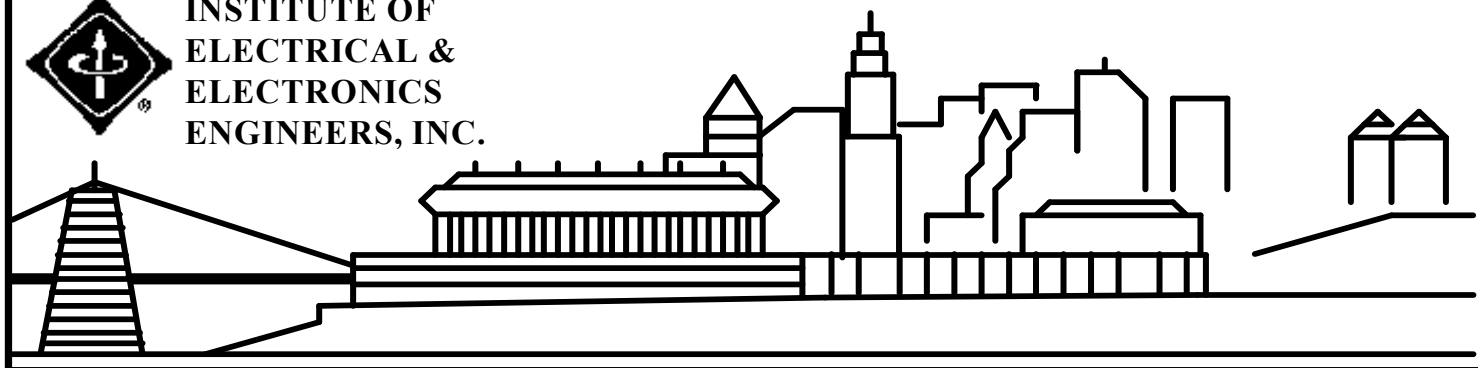




**INSTITUTE OF
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ENGINEERS, INC.**



JANUARY 1993

IEEE CINCINNATI SECTION NEWSLETTER

JANUARY MEETING: National Aerospace Plane

DATE: Thursday, January 21, 1993

PLACE: Institute of Advanced Manufacturing Sciences (IAMS)

TIME: 5:00 Social Time
5:30 Dinner (Roast turkey & dressing)
6:30 Program
8:00 Adjourn

COST: \$6.00 Members
\$3.00 Students
\$9.00 Non-Members

Attendance is limited !!!!!!!

Reservations are required for dinner only!

CALL DEBRA AT 287-2869 BY NOON, WEDNESDAY, JANUARY 20th Please provide NAME, MEMBER # and COMPANY NAME when making reservations

ABOUT THE MEETING....

The presentation, to be provided by Mr. William Powell of NASA/MSFC, will be an overview of the National Aerospace Plane (NASP) Joint Program Office at Wright-Patterson Air Force Base in Dayton, Ohio. Mr. Powell is employed by NASA/MSFC and is currently working as the Deputy Director, Systems Application in the NASP Joint Program Office, providing coordination/interface with NASA and the JPO. Mr. Powell is a licensed PE in KY and NC.

DIRECTIONS:

- I75 South to Paddock Rd. Exit (within I-275 beltway in Cincinnati).
- Turn left (east) onto Paddock Rd. for approx. 1/2 mile to Edison Dr. (right side of road).
- Follow the lane to the IAMS building and park in front.

MARCONI & THE WIRELESS TELEGRAPH

PART 2

by Dick Reiman, Historian

It was not until 1914 that Marconi won his battles on the patent battlefield. Judge Van Vechten Veeder's decision in United States District Court held that all patents filed in the United States by Marconi were valid. The decision in Marconi's favor was based upon the instruments and system which made possible communications over a distance of 6,000 miles, which over 1,000 installations had proven to be practical. Particular stress was given to the discovery of a vertical aerial wire (antenna) and connection of the apparatus to earth or water. Lodge in 1894 had theorized to the nature of electromagnetic waves from Hertz's experiments, and Popoff, in 1895, had detected the existence of lightning from a distant thunderstorm, but Marconi was the first to transmit and receive intelligible signals with a wireless telegraph apparatus.

At the turn of the century, it was remarked that it was still difficult to invent anything basically new in radio, and still more difficult to invent anything which did not touch upon an invention of Nicola Tesla. For example, Tesla had obtained patents on more than 100 tuning inventions and he had demonstrated the principles of tuning. Lodge used feebly damped oscillations in his 1898 patent apparatus to obtain resonance. Lodge could not obtain sufficient radiation of the transmitter and at the same time obtain a sensitive receiver. Marconi overcame these difficulties in his second patent, by introducing a pair of circuits in both the transmitter and the receiver in place of a single circuit. One was designed to radiate or absorb readily, and the other to oscillate persistently and be a good conserver of energy. Finally, the four circuits had to be tuned together. Marconi's apparatus was able to obtain the persistency of oscillation without sacrificing radiation qualities and allow an increase in the available amount of energy drawn from the local circuits of the transmitter. With this definite control over radiation, effective selectivity was maintained and the distance over which messages could be sent greatly increased.

The three basic technical problems which had to be solved to establish successful wireless communications, and later radio broadcasting, were:

- Establishing the physical laws that govern the propagation of electromagnetic or radio waves in the proximity of Earth's surface (Maxwell's equations applied to waves in free space),
- Inventing or developing transmitters for generating radio waves of substantial power and, for the radiotelephone, modulating the waves with voice or musical signals to be transmitted,
- Inventing or developing equipment for reception, detection, and amplification of radio signals.

Progress in these technical matters and in agreements to regulate transmission of radio signals would be the work to follow in the 1920's.

In 1895, Marconi was able to communicate for a distance of a mile on his father's estate. In 1898, he established a link across the English Channel. And in 1901, he performed the remarkable feat of wireless communications across the Atlantic from Cornwall, England to Cape Cod, Massachusetts. In April 1912, the Titanic, equipped with Marconi wireless, was warned by four other ships of the presence of icebergs in the North Atlantic. An SOS signal was sent but the Titanic sank in three hours while rescue by the Carpathia took over four hours.

Dr. Mahlon Loomis in America in 1865, described a wireless communication scheme and coined the term "ether", and Edison observed in 1875 in his Newark laboratory the generation of sparks from electrical gaps, and actually took out a patent on a wireless telegraphy. Tesla had demonstrated the principle of tuning in 1891. The wireless, however, is called Marconi wireless.

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